



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,263	09/25/2003	Yong Wang	12859B-DIV	3226
34833	7590	08/16/2006		
FRANK ROSENBERG 18 ECHO HILL LANE MORAGA, CA 94556			EXAMINER RIDLEY, BASIA ANNA	
			ART UNIT	PAPER NUMBER
			1764	
DATE MAILED: 08/16/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/669,263

Applicant(s)

WANG ET AL.

Examiner

Basia Ridley

*BR*

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 22-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 22-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. In view of applicant's arguments filed 29 April 2006 the finality of the previous Office action is hereby withdrawn. Applicant's submission after final filed on 29 April 2006 has been entered.
2. Applicant's arguments, see pages 5-6 of Response filed 29 April 2006, with respect to rejection of claims 22 and 32 over Hepp et al. (USP 3,461,183) in view of Saito et al. (USP 5,935,529) in view of Tonkovich et al. (US 2003/0072699) have been fully considered and found persuasive. Said rejection has been withdrawn.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2-6 and 22-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2-6 and 22-34 recites the limitation(s) "the catalyst". There is insufficient antecedent basis for said limitation(s) in the claims as more than one catalyst is recited in claim 1 (see claim 1, lines 1 and 4).

Claims 27-29 recite "the materials pore volume". Said limitation is indefinite, because more than one material is recited in the claims prior to said limitation. Suggested correction is to replace "the materials pore volume" with --the catalyst's pore volume--, as recited in claim 4.

#### ***Claim Rejections - 35 USC § 103***

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Art Unit: 1764

6. Claims 1-6 and 23-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hepp et al. (USP 3,461,183) in view of Schuh et al. (WO 99/15715).

Regarding claim 1 Hepp et al. discloses a catalyst comprising:

- a zirconia-supported, alkali metal modified ruthenium catalyst (C2/L1-35).

Additionally, while Hepp et al. does not explicitly disclose said catalyst being disposed over a porous substrate, the reference discloses that said catalyst is in the form of spheres (C7/L1-75).

Desired properties of the catalyst of Hepp et al. are longer life on stream and high activity (C1/L10-75, C2/L35-41, C3/L10-30). Further, Hepp et al. discloses that it is desired to use said catalyst in processes producing compressed product (C1/L35-54), therefore, said processes should operate with low pressure drop.

Schuh et al. teaches an improved catalyst comprising, among others, a zirconia-supported ruthenium catalyst (P8/L11-27). The improvement constitutes disposing said catalyst over a porous substrate having an average pore size from 1  $\mu\text{m}$  to 1000  $\mu\text{m}$  (Abstract; P19/L9-25). The benefits of using said improved catalyst are, among others, higher activity, enhanced catalyst life and low pressure drop (P14/L4-10).

It would have been obvious to one having ordinary skill in the art at the time of the invention to dispose the catalyst of Hepp et al. over the porous substrate of Schuh et al. for the purpose of improving catalyst activity, enhancing catalyst life and operating at low pressure drop.

Regarding claim 2, Hepp et al. in view of Schuh et al. disclose all of the claim limitations as set forth above. Additionally, as claim 2 is a product-by-process claim, patentability of said claim is based on the recited product and does not depend on its method of production. Since the product in claim 2 is the same as product disclosed by Hepp et al. in view of Schuh et al. the claim would be unpatentable even if the product of Hepp et al. in view of Schuh et al. was made by a different process. *In re*

Art Unit: 1764

*Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). See MPEP 2113. This being said, the examiner notes that Hepp et al. does, in fact, disclose the catalyst made by steps comprising: impregnating porous support with solution containing Ru and K, calcining and reducing (C3/L68-C8/L25), wherein said porous support comprises zirconia (C2/L1-35).

Regarding claims 3 and 23-24 Hepp et al. in view of Schuh et al. disclose all of the claim limitations as set forth above. Additionally Hepp et al. discloses the catalyst comprising:

- 0.1 to 10 wt% Ru and 0.1 to 10 wt% K (C2/L1-35 and C3/L68-C8/L25);
- 0.2 to 3 wt% Ru and 0.1 to 10 wt% K (C2/L1-35 and C3/L68-C8/L25).
- 0.5 to 3 wt% K (C2/L1-35 and C3/L68-C8/L25).

Regarding claims 4 and 27-29, Hepp et al. in view of Schuh et al. disclose all of the claim limitations as set forth above. Additionally while Hepp et al. in view of Schuh et al. do not explicitly disclose any specific pore size distribution of the catalyst, Schuh et al. does disclose that the penetration of the coating into the interior of the porous substrate and the coating thickness are variables that can be controlled, among others, by varying the pore size of the porous substrate (P6/L19-P7/L8). Therefore the specific pore size distribution of the catalyst can not be considered to confer patentability to the claims because the precise pore size distribution of the catalyst would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed pore size distribution of the catalyst cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the pore size distribution of the catalyst of Hepp et al. in view of Schuh et al. to obtain the desired penetration of the coating into the interior of the porous substrate and the desired coating thickness (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are

Art Unit: 1764

disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claims 5-6, 30-31 and 33-34, Hepp et al. in view of Schuh et al. disclose all of the claim limitations as set forth above. Additionally, regarding limitations recited in said claims, which are directed to specific properties of the catalyst and its performance, the examiner notes that once a specific catalyst composition is disclosed by the references, as set forth above, the disclosed catalyst will, inherently, display recited properties.

Regarding claim 25, Hepp et al. in view of Schuh et al. disclose all of the claim limitations as set forth above. Additionally Hepp et al. discloses the catalyst comprising porous support with a surface area greater than  $10 \text{ m}^2/\text{g}$  (C7/L19-75). Further, Hepp et al. discloses the catalyst wherein said porous support comprises zirconia (C2/L1-35). In view of said disclosure, it would have been obvious to one having ordinary skill in the art at the time of the invention to replace said porous support with a surface area greater than  $10 \text{ m}^2/\text{g}$  (Hepp et al., C7/L19-75) with zirconia having a surface area greater than  $10 \text{ m}^2/\text{g}$  to obtain catalyst with similar catalyst activity.

Further, regarding claim 25, the examiner notes that recited BET surface area of  $\text{ZrO}_2$  is not considered to confer patentability to the claims. As the catalyst activity is a variable that can be modified, among others, by adjusting BET surface area of  $\text{ZrO}_2$  (catalyst support), the precise BET surface area of  $\text{ZrO}_2$  would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed BET surface area of  $\text{ZrO}_2$  cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the BET surface area of  $\text{ZrO}_2$  in the catalyst of Hepp et al. in view of Schuh et al. to obtain the desired catalyst activity (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where

Art Unit: 1764

the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claims 26 and 32, Hepp et al. in view of Schuh et al. disclose all of the claim limitations as set forth above. Additionally, Schuh et al. discloses the catalyst having:

- a pore volume of 30 to 95% (P19/L7-25);
- wherein the porous substrate comprises a felt (P19/L7-25).

7. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hepp et al. (USP 3,461,183) in view of Schuh et al. (WO 99/15715) and further in view of Hiramatsu et al. (EP 480,461).

Regarding claim 22 Hepp et al. in view of Schuh et al. disclose all of the claim limitations as set forth above. Additionally Schuh et al. discloses the catalyst wherein the porous substrate comprises Fe-Cr-Al alloys (P5/L10-21), but the reference does not explicitly disclose said substrate further comprising Y.

It was known in the art at the time of the invention that stainless steels comprising a FeCrAl and Y can be effectively used as catalyst supports, and further it was known in the art at the time of the invention that the manufacturing cost and final properties of the finished catalyst are variables that can be modified, among others, by varying the composition of said stainless steel substrate (e.g. Hiramatsu et al. see P2/L6-52). In view of this knowledge, specific composition of the stainless steel support can not be considered to confer patentability to the claims because it would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the specific support composition cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the specific composition of the stainless steel support of Schuh et al. to

Art Unit: 1764

obtain the desired catalyst properties (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Further, Hiramatsu et al. teaches that stainless steels comprising a FeCrAl and Y can be effectively used as catalyst supports (P2/L6-52). Therefore, use of said stainless steel comprising FeCrAl and Y as a support for the catalyst of Hepp et al. in view of Schuh et al. would be obvious to one of ordinary skill in the art, because it would amount to nothing more than a use of a known material for its intended use in a known environment to accomplish entirely expected result.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

### ***Response to Arguments***

9. Applicant's arguments filed 29 April 2006 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

10. In view of the foregoing, none of the claims are allowed.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

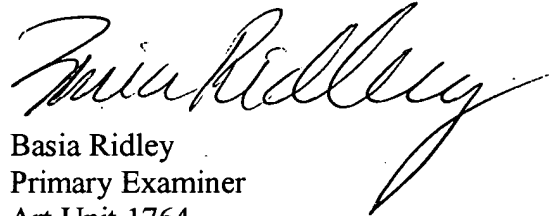


Art Unit: 1764

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).



Basia Ridley  
Primary Examiner  
Art Unit 1764

BR

August 14, 2006